

REMARKS

Claims 17-29 are pending and stand ready for further action on the merits.

Support for inserting the term "monochromatic" into claim 17 can be found in page 62, lines 19-21. Support for the newly recited substituents for V<sup>3</sup>, V<sup>6</sup> and V<sup>12</sup> in claim 17 can be found in pages 27-31.

No new matter has been added by way of the above-amendment.

Issues Under 35 U.S.C. §103

The following rejections are pending:

- (1) Claims 17-22, 25-29 are rejected under 35 U.S.C. §103(a) as being unpatentable over either Takeuchi or Nakamura et al. (Nakamura) in view of the combination of Cerquone et al. (Cerquone) and EP 0762196 (EP '196); and
- (2) Claims 23-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Takeuchi or Nakamura et al. (Nakamura) as applied to claims 17-22, 25-27 above, and further in view of JP10339934 (JP '934).

Applicants respectfully traverse each of the above rejections.

In the outstanding Office Action, the Examiner indicates that he has fully considered Applicants' amendment filed February 26,

2003. However, the Examiner has maintained the rejection for the following reasons:

It is the Examiner's position that the claimed invention is prima facie obvious over the applied prior art of record. The phenol compound has been known in used as reducing agent for silver ions and the hydrazine taught in Nakamura or Takeuchi has been known as color developing agent, and Cerquone et.al discloses the use of reducing agent for silver ion in combination with color developing agent to produce a desired image, and the use a known reducing agent in the material containing color developing agent would have been found prima facie obvious to the worker of ordinary skill in the art. (Emphasis added).

In response to the Examiner's arguments reiterated above, Applicants have amended claim 17 (the only independent claim) to recite that the photothermographic material is "monochromatic". As such, color photosensitive materials are excluded from the claimed invention.

Since it is quite clear that nonchromatic photothermographic material does not need a color developing agent, the Examiner's comments do not relate to the invention as presently claimed. Specifically, the skilled artisan would not have been motivated to use the hydrazine taught in Nakamura or Takeuchi as a color developing agent in order to produce the claimed monochromatic photothermographic material, before the claimed invention was made. Also, the skilled artisan would not have been motivated to use a reducing agent for silver ion in combination with a color

developing agent in order to produce a desired monochromatic image, before the claimed invention was made..

The courts have consistently taken the position that if a reference needs to be modified to achieve the claimed invention "there must be a showing of a suggestion or motivation to modify the teachings of that reference to the claimed invention in order to support the obviousness conclusion." Sibia Neurosciences Inc. v. Cadus Pharmaceutical Corp. 55 USPQ2d 1927 (Fed. Cir. 2000). With regard to the instant case, the skilled artisan would not find the presently claimed invention obvious, since there would be no motivation to use the hydrazine of Nakamura or Takeuchi to prepare a photothermographic material which is monochromatic.

In addition, the amendment to the variables  $V^3$ ,  $V^6$  and  $V^{12}$  in the reducing agents of inventive formulas (2) and (3) has been made to further distinguish from the teachings of Cerquone. Cerquone discloses a photothermographic element containing a reducing agent which is a 2,6-dichloro or 2,6-dibromo-4-sulfonamidophenol, and a four equivalent color-forming coupler. Compounds D-101 to D-206 and Compounds I-1 to I-34 and II-1 to II-31 are neither 2,6-dichloro or 2,6-dibromo-4-sulfonamidophenol nor four equivalent color-forming coupler. Because of the restriction of  $V^3$ ,  $V^6$  and  $V^{12}$  in Claim 17, formulas (1) to (3) do not include the sulfonamidophenol and the coupler.

As such, a *prima facie* case of obviousness can not be said to exist over the cited references since the combination does not fairly suggest the inventive photothermographic material.

Even assuming *arguendo* that a *prima facie* case of obviousness does exist, Applicants respectfully submit that the evidence of unexpected results obviates the theoretical *prima facie* case.

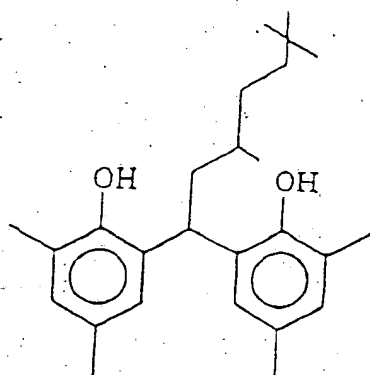
In the present claims, the invention is characterized by incorporating both a reducing compound represented by the formula (1) and a reducing compound represented by the formula (2) or (3) in a monochromatic photothermographic material. However, none of the cited references teach or fairly suggest this combination. For example, Nakamura, Takeuchi and Cerquone do not mention that the hydrazine compounds of inventive formula (1) can be used as a reducing agent. Applicants respectfully submit that this combination of reducing compounds has a synergistic effect and unexpectedly creates a superadditive improvement in sensitivity of the photothermographic material.

This is shown in Table 1 on page 109 of the present specification, and some of the relevant data is included in the following table for the Examiner's convenience:

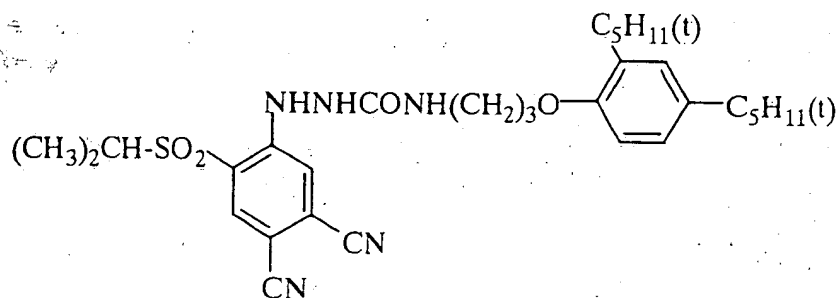
Table 1

Sample No.	Reducing agent 1		Reducing agent 2		117°C for 20 seconds (B)	115°C for 20 seconds (C)	After storage at 50°C
	No.	Amount (mmol)	No.	Amount ( $\mu$ mol)	Sensitivity	Sensitivity	Sensitivity
101	I-1	15.7			-0.22	-0.49	-0.29
106	I-1	15.7	D-101	157	0.07	0.01	0.02
108	I-1	15.7	D-119	157	0.05	-0.02	0.01
109	I-1	15.7	D-137	157	0.01	-0.12	-0.04

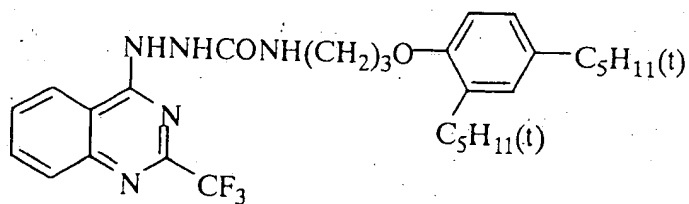
I-1



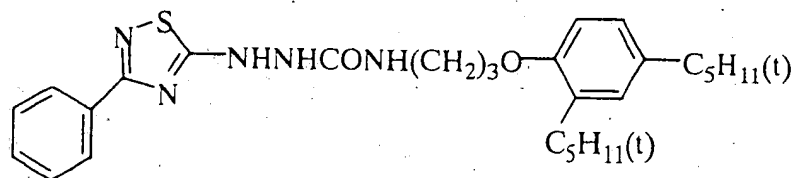
D-101



D-119



D-137



As can be seen from the above data, there is clearly a remarkable improvement in the sensitivity of the photothermographic material incorporating the combination of the hydrazine compound of formula (1) with the reducing compound of formula (2).

For example, a monochromatic photothermographic material containing the hydrazine compound I-1 has a sensitivity of -0.49 when exposed to temperatures of 115°C for 20 seconds. This is in distinction to the sensitivity value of 0.01 which is seen using essentially the same material except that the hydrazine compound I-1 is used in combination with the reducing agent D-101. Clearly such an improvement involves a synergistic effect between the hydrazine compound of I-1 and the reducing agent D-101. Similar results were found for the combination of the hydrazine reducing agent I-1 with the reducing agents D-119 and D-137.

In addition to the data in the specification, Applicants enclose herewith a Declaration Under 37 C.F.R. §1.132 by one of the co-inventors, Mr. Toyohisa Oya as evidence of the patentability of the present invention over the teachings of the cited references. In the Declaration, the photothermographic materials prepared with the reducing agent of formula (1) having a concentration ratio range of 0.1-10 mol% based on the amount of the compound represented by the formula (2) or (3) is shown to have unexpectedly superior properties when compared to materials prepared with

reducing agents outside this concentration ratio range with respect to the combination of sensitivity and low fog.

Specifically, the Examiner's attention is directed to Experiment 7 in the enclosed Declaration. The following Table 2 incorporates the data obtained in Experiment 7 for the Examiner's convenience:

Table 2

Sample No.	(D-119)/(I-1)	Dmax	Fog	Relative Sensitivity	Note
701	0.06%	1.45	0.12	0.00	Comparative
702	0.12%	1.47	0.11	0.02	Invention
703	8.3%	1.66	0.29	0.45	Invention
704	12.1%	1.63	Strong	-	Comparative

In this data, it is clearly shown that Sample 701, having a concentration ratio of 0.06 mol% does not improve sensitivity of the monochromatic photothermographic material. Also, Sample 704, having a concentration ratio of 12.1 mol% exhibits strong fog. This is in distinction to inventive Sample 702, having a concentration ratio of 1.2 mol% and Sample 703, having a concentration ratio of 8.3 mol%, which show a great improvement in both the sensitivity and low fog.

Upon review of the cited references, it is noted that none teach or fairly suggest the criticality of this concentration range, and the skilled artisan would not have predicted such an improvement in low fog and sensitivity.

The Examiner will note that the concentration ratio range of 0.1-10 mole% is small in comparison with the generic disclosure of Takeuchi and Nakamura. In Takeuchi and Nakamura, hydrazine compounds are used as a color developing agent and phenol compounds are used as a coupler. Since the color developing agent is reacted with the coupler to form a color image, a theoretical amount of the color developing agent required is 100 mole% or more of the coupler. In this regard, Takeuchi and Nakamura state that a preferred amount is 20 to 500 mole % (0.2 to 5 times). Please see column 53, lines 1-5 of Takeuchi and column 104, lines 41-47 of Nakamura. This is in distinction to the claimed invention which does not intend to form a colored image by the reaction of the hydrazine compound of formula (1) and the reducing compound of formula (2) or (3).

It has long been established that to rebut an obviousness rejection, an Applicant may submit evidence that the invention provides benefits or produces results that would have been unexpected to one of ordinary skill. As stated by the Federal Circuit:

One way for a patent Applicant to rebut a *prima facie* case of obviousness is to make a showing of "unexpected results" i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principal behind this rule is straight forward - that which would have been surprising to a person of ordinary skill in a particular art would not have been



obvious. The principal applies most often to the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results. *In re Soni* 34 USPQ2d 1684 (Fed. Cir. 1995).

Accordingly, even if a *prima facie* case of obviousness were said to exist, the evidence of unexpected results would obviate such a *prima facie* case. As such, withdrawal of each of the rejections is respectfully requested.

#### Conclusion

In view of the above amendments and comments, Applicants respectfully submit that the claims are in condition for allowance. However, should the Examiner find to the contrary, Applicants respectfully request that the Examiner enters this Amendment into the official record, to place the claims in better form for appeal.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants hereby petition for an extension of two (2) months to October 5, 2003 in which to file a reply to the Office Action. The required fee of \$420.00 is enclosed herewith.


If the Examiner has any questions or comments, please contact Craig A. McRobbie, Registration No. 42,874 at 703-205-8000 at the offices of Birch, Stewart, Kolasch & Birch, LLP.


If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees

required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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